

Presenting Misleading Statistics as the Truth

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Overview:

As consumers of information and of products, we are often misinformed. At times this is intentional practice in order to manipulate the consumer's thought process in order to benefit the individual or group who has chosen to intentionally manipulate information. At other times, manipulation happens purely by accident, possibly due to improper execution of a study or survey. Either way, misinformation can greatly impact our society. In order to think analytically and avoid persuasion, it is important that we learn to identify misinformation. During this assignment, the student will be asked to intentionally present two misleading statistics as truth. To intentionally present a misleading statistic, the student should have an understanding of the types of statistical fallacies. Wikipedia, in an article entitled *Misuse of Statistics*, educates readers on nine types of misuse. This article has been saved in its format that the statistics teacher and I approve of in order to protect the quality of the content and this is the source that is used for students to refer to.

Resources:

Computer lab with internet access

Wikipedia article on Misuse of Statistics

Assignment handout/description with score totals attached

Example Response Sheet

Response Sheet

Objectives:

- Students will analyze the nine types of statistical misuse and apply them by creating a research plan.
- Students will research statistics and synthesize two statistics with two types of misuse through the creation of a product.

Procedure/Activity:

Read over the lesson overview and discuss the importance that as consumers of information and products that they become aware of manipulation of both.

- ask students for examples of manipulation that they have witnessed (if they do not have examples, be prepared with some to share)
- ask students how manipulation may also happen by accident (interpretation, etc.)

Model response sheet using example

- Have everyone read "Overgeneralization"
- Try to elicit a response for the response sheet from them. If they struggle, offer that for the first, they'd need to locate a statistical statement and second, they'd need to alter the wording.
- Point out example sheet that they can refer to

Allow time for assignment completion

- Day 1: In your group, read the article *Misuse of Statistics* from Wikipedia. Fill out a response sheet for each of the nine types of misuse.
- Day 2: Locate **two** statistics and manipulate the data, presenting statistical fallacies as truth. You must use **two** separate types of misuse (see your response sheets) and incorporate your misleading statistic into the following presentation formats selecting **two** different formats:

Format choices:

- an advertisement of any consumer product or (legal) drug (presentation can be created graphically or using multimedia tools)
 - a political cartoon or political advertisement
 - a fictional web page
 - a set of fictional blog entries (get creative with responses by your fictional characters, but keep it appropriate for school)
 - any other presentation **approved by your teacher**
- Present the misleading information to your audience and follow it up with the true statistical information and explain the process that you followed.

Assessment:

Informal assessment of students will take place for the first objective

Exit Ticket for day one: name two ideas for statistics manipulation that you have thought of.

Assessment of the second objective will take place using the score sheet that is handed to the students.

Standards/District Initiatives Met:

Daniel Pink Creativity Elements: Design, Story, Symphony, Play, Meaning

AASL Standards for the 21st Century Learner

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| 1.1.7 | Make sense of information gathered from diverse sources by identifying misconceptions, main and supporting ideas, conflicting information, and point of view or bias. |
| 2.1.1 | continue an inquiry-based research process by applying critical thinking skills (analysis, synthesis, evaluation, organization) to information and knowledge in order to construct new understandings, draw conclusions, and create new knowledge. |
| 2.2.1 | Demonstrate flexibility in the use of resources by adapting information strategies to each specific resource and by seeking additional resources when clear conclusions cannot be |

drawn.

2.3.1 Connect understanding to the real world.

PA Academic Standards for Mathematics

2.4.11.B Construct valid arguments from stated facts.

2.5.11.A Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.

2.7.11.C Draw and justify a conclusion regarding the validity of a probability or statistical argument.

PA Assessment Anchors for Mathematics

M11.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.

M11.E.2 Select and/or use appropriate statistical methods to analyze data.